EXHIBIT RAM-9
HAI XDSL Adjunct Model
Inputs Portfolio

1.0 Introduction

This document defines the user-adjustable inputs to the HAI XDSL Adjunct Mode. The following sections, organized by function, include the definition of each input variable, its default value, and the justification for the default value.

All of the investment inputs represent "list" prices. The Model applies a separate user-adjustable discount factor to all investment inputs.

2.0 "Take rates"

Definition: These values represent the acceptance rates for xDSL service. The xDSL inputs specify the fraction of residential and single-line business lines[1] accepting service. There are separate inputs for each class of service. These inputs have very little impact on model outputs because outputs are expressed on a per-line or per-DS-3 basis, and the number of lines served per DS-3 is governed by an input discussed below. The primary function of these inputs is to allow the user to estimate costs on a total, rather than per-line or per-DS-3, basis.

Default values:

ADSL		
	Residential copper loops	0.05
	Business copper loops	0.05
	Residential DLC loops	0.05
	Business DLC loops	0.05
HDSL		
	Copper loops	0.05
	DLC loops	0.05

Justification: Model development team estimates, developed from ILEC penetration

[1] The user may optionally choose to include all business lines, including single- and multi-line business lines, in the ADSL calculations by indicating this choice in a check box found at the top of the "xDSL Inputs" worksheet in the Model.

estimates provided in CC Docket Nos. 98-79, 98-103, and 98-161.

3.0 DSL inputs

3.1 DSL investment – copper loops

This section describes inputs pertaining to copper loops.

3.1.1 Average investment per DSLAM

Definition: Investment per line for DSLAM equipment

Default value: $393

Justification: Model development team estimate of undiscounted investment based on members' engineering experience

3.1.2 Wire center splitter investment per line

Definition: Investment per line in wire-center-mounted splitter for copper loops.

Default value: $47.62

Justification: Model development team estimate of undiscounted investment based on members' engineering experience

3.1.3 Splitter installation

Definition: Investment multiplier representing installation of shelves, wiring, and circuit boards for wire center splitters

Default value: 1.25

Justification: Model development team estimate based on members' engineering experience

3.1.4 Installation factor

Definition:

3.2 DSL-related DLC investment

This section describes inputs pertaining to DLC-served loops. The Model calculates the additional cost of DLC remote terminals ("RTs") equipped to provide high bandwidth services in excess of the cost of RTs previously deployed. The model assumes that previously deployed DLC remote terminals must be upgraded to accommodate high bandwidth services. Provision of xDSL services also require appropriate xDSL channel units. The DSLAM and splitter functions are assumed to be contained within the channel unit.

Because of the limited data available concerning DSL-capable DLCs, the HBSOM estimates the additional cost of RT common equipment by reference to upgrade equipment currently available, such as Litespan 2012. This is a conservative overstatement of a true TELRIC-based price because TELRIC should only include costs of a fully optimized, forward-looking network, with the exception of placement of wire centers. Optimization of DLC equipment to provide for the possibility of high bandwidth services, and optimization of a network including such equipment would result in a lower overall cost.

3.2.1 RT ADSL upgrade investment – medium density

Definition: Investment required to upgrade medium-density DLC remote terminals similar to Advanced Fibre Communications equipment to accommodate DSLAM channel units and the increased feeder bandwidth required by the DSL digital signals.

Default value: $5,700

Justification: Model development team estimate of investment in software upgrade and common equipment circuit boards required to be added to existing medium density RT equipment to accommodate high bandwidth services.

3.2.2 RT upgrade investment – high density

Definition: Investment required to upgrade the high-density DLC remote terminals similar to Litespan equipment to accommodate channel units for high bandwidth services and the increased feeder bandwidth required by high bandwidth services.

Default value: $31,500

Justification: Model development team estimate of investment in software upgrade and common equipment circuit boards required to be added to existing high density RT equipment to accommodate high bandwidth services.

3.2.3 ADSL channel unit investment

Definition: The ADSL channel unit provides the DSLAM and splitter function in

the DLC RT. The Model assumes that the channel unit is compatible with either the medium-density or high-density RT. The input value represents the portion of the channel unit that serves the DSLAM and splitter function only and does not include investment related to POTS functions such as hybrid, codec, battery, etc.

Default value: $393

Justification: Model development team estimate of undiscounted investment based on members' engineering experience

3.3 ADSL miscellaneous inputs

3.3.2 DSX-3 panel investment

Definition: Conservative assumption of investment for a manual patch panel required for interconnecting DS-3 signals from DSLAMs with transmission equipment in wire center. This equipment provides for the simple, passive connection of coax cable jumpers, contains no electronics, and requires no power.

Default value: $2,500

Justification: Model development team estimate based on members' engineering experience

3.3.3 DSX-3 panel capacity, DS-3s

Definition: Number of DS-3s that each DSX-3 can handle

Default value: 16

Justification: Model development team estimate based on members' engineering experience

3.3.4 RT upgrade capacity for high bandwidth services – medium density

Definition: Capacity to serve high bandwidth services made available on medium density RT by installing upgrade described above, expressed in DS3s,

Default value: 2

Justification: Model development team estimate of capacity made available to high

bandwidth services by upgrading medium density RT equipment.

3.3.5 RT upgrade capacity for high bandwidth services – high density

Definition: Capacity to serve high bandwidth services made available on medium density RT by installing upgrade described above, expressed in DS3s,

Default value: 9

Justification: Model development team estimate based on upgrading high density RT equipment (similar to Litespan 2012) from OC3 to OC12.

3.3.6 Average subscribers per DS-3

Definition: Average number of ADSL subscribers carried on a DS-3 ATM transport facility.

Default value: 1,000

Justification: Nokia's Speedlink DSLAM presently accommodates 1152 line ports per DS3 and is expected to provide line cards to accommodate 2304 line ports per DS3 in the near future. The conservative assumption of 1000 ADSL subscribers per DS3 makes allowance for higher quality of service levels than unspecified bit rate.

3.3.7 Lines per ADSL channel unit

Definition: Number of lines on each ADSL channel unit for RTs.

Default value: 4

Justification: Model development team judgement based on members' engineering experience.

3.3.8 Transport DS3/month

Definition: Monthly transport cost per DS3

Default value: Determined by input HAI Model run for study area in question; may be overridden by user if, for example, commission-ordered values are to be used.

3.4 ADSL packet switching inputs

This section contains input values pertaining to ILEC-provided packet switching services applied to ADSL bit streams.

3.4.1 ATM edge switch investment, installed

Definition: The ATM switch is used as a means to aggregate and segregate data traffic between subscribers and a range of service providers and carriers.

Default value: $125,000

Justification: List price of edge switch similar to FORE 200BX, with 1.25 installation factor applied.

3.4.2 Edge switch capacity, Gbps

Definition: Capacity or throughput of ATM edge switch.

Default value: 2.5 Gbps

Justification: FORE 200 BX capacity.

3.5 Utilization Inputs

This section contains input values pertaining to utilization of equipment for high bandwidth services. In particular, upgraded capacity on RTs and OCDs is available to a wide range of high bandwidth services - not just xDSL services. The model assumes that the ILEC will use this capacity for some combination of high bandwidth services and achieve, on average over the life of the equipment, the utilization level indicated by the input value. Since the equipment investment is undertaken in anticipation of growing demand for new services without historical data, the default values are intended to be extremely conservative.

3.5.1 Utilization on high bandwidth capacity of upgraded RT - High Density

Definition: Average expected utilization over the economic life of a high density RT upgrade. The ratio of average expected high bandwidth capacity in use to high bandwidth capacity available.

Default value: .1

Justification: Value based on model development team judgement.

3.5.2 Utilization on high bandwidth capacity of upgraded RT - Medium Density

Definition: Average expected utilization over the economic life of a high density RT upgrade. The ratio of average expected high bandwidth capacity in use to high bandwidth capacity available.

Default value: .1

Justification: Value based on model development team judgement.

3.5.3 OCD Utilization

Definition: Average expected utilization over the economic life of an OCD. The ratio of average expected capacity in use to capacity available.

Default value: .1

Justification: Value based on model development team judgement.

3.6 HDSL-related inputs

3.6.1 Average investment per HDSL loop – copper/fiber

Definition: Average investment per line in HDSL terminal equipment; does not include customer premises HDSL terminal unit. For DLC case, investment represents investment per HDSL connection in HDSL channel unit

Default value: $388

Justification: Value based on model development team judgement

3.6.2 Average investment per HDSL2 loop – copper/fiber

Definition: Average investment per line in HDSL2 (two-wire) terminal equipment; does not include customer premises HDSL2 terminal unit. For DLC case, investment represents investment per HDSL2 connection in HDSL2 channel unit

Default value: $460

Justification: Value based on model development team judgement

3.6.3 HTU installation factor

Definition: Multiplier applied to HTU investment to reflect cost of installation

Default value: 1.25

Justification: Value based on model development team judgement

3.6.4 HDSL regenerator investment

Definition: Investment in HDSL regenerators required for HDSL-carrying copper loops with lengths greater than 12,000 ft.

Default value: $1700

Justification: Value based on model development team judgement

3.6.5 HDSL2 regenerator investment

Definition: Investment in HDSL2 regenerators required for HDSL2-carrying copper loops with lengths greater than 12,000 ft.

Default value: $1870

Justification: Value based on model development team judgement

3.6.6 Regenerator installation factor

Definition: Multiplier applied to HDSL and HDSL2 regenerator investment to reflect cost on installation

Default value: 1.25

Justification: Value based on model development team judgement

3.6.7 Four-wire loop UNE multiplier

Definition: Multiplier applied to total loop UNE from HM5.2a to obtain four-wire loop cost

Default value: 1.3

Justification: Derived from HM runs for four-wire loops; value is ratio of four-wire loop cost to standard two-wire costs produced by HM

3.6.8 Fraction of HDSL lines requiring regeneration

Definition: Estimate of fraction of total business lines with lengths between 12,000 and 18,000 ft

Default value: 0.15

Justification: Value estimated from Bellcore loop surveys

3.6.9 Effective circuits per DS-1

Definition: Number of circuits in channelized DS-1 transmission system

Default value: 24

Justification: Number of DS-0s in channelized DS-1 systems

3.6.10 Effective DS-1 fill

Definition: Average fraction of active DS-0s in a DS-1 system

Default value: 0.5

Justification: Value deemed conservative by model development team

3.6.11 HDSL line threshold per wire center

Definition: Threshold value for calculation of HDSL investment in given wire center; value expressed in number of T1s estimated per wire center

Default value: 1

Justification: Model development team choice

3.7 Cost of capital and economic life inputs

The quantities in this section are the "financial" inputs to the model and pertain to the capital structure, overhead, tax, and depreciation calculations in the model. The model adjusts the economic life by the salvage value to calculate depreciation each listed investment input.

The equipment discount factor applies to all of the investments described above.

3.7.1 ADSL channel unit life

Default value: 5 years

Justification: This value represents a conservative reduction from the average value (10.24 years) derived from values adopted in FCC/State Commission/ILEC three-way meetings for digital circuit equipment.

3.7.2 ADSL channel unit salvage

Default value: - 0%

Justification: See ADSL channel unit life above.

3.7.3 Remote Terminal equipment life

Default value: 5 years

Justification: This value represents a conservative reduction from the average value (10.24 years) derived from values adopted in FCC/State Commission/ILEC three-way meetings for digital circuit equipment.

3.7.4 Remote Terminal equipment salvage

Default value: - 0%

Justification: See ADSL channel unit life above.

3.7.5 Switching equipment life

Default value: 16.17 years

Justification: Derived from values adopted in FCC/State Commission/ILEC three-way meetings.

3.7.6 Switching equipment salvage

Default value: 2.97%

Justification: Derived from values adopted in FCC/State Commission/ILEC three-way meetings.

3.7.7 Computer equipment life

Default value: 6.12 years

Justification: Derived from values adopted in FCC/State Commission/ILEC three-way meetings.

3.7.8 Computer equipment salvage

Default value: 3.73%

Justification: Derived from values adopted in FCC/State Commission/ILEC three-way meetings.

3.7.9 Cost of debt

Default value: 7.7%

3.7.10 Debt fraction

Default value: 45%

3.7.11 Cost of equity

Default value: 11.9%

3.7.12 Corporate overhead

Default value: 12.54%

Justification: Illinois-specific value

3.7.13 Other taxes

Default value: 5%

3.7.14 Tax rate

Default value: 39.25%

3.7.15 Equipment discount factor

Default value 30%

Justification: Model development team members' industry experience